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Effect of Benson's Relaxation Technique by Telerehabilitation on Quality of Life During Quarantine of COVID-19

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Abstract

Background: Stress and anxiety are highly reported during quarantine of corona virus disease COVID-19.

Aim of Study: To investigate the effect of Benson's relaxation technique by telerehabilitation on quality of life during quarantine of (COVID-19).

Patients and Methods: This study included sixty acute phase COVID-19 patients of both genders, selected from Zagazig University Hospital's Chest Disease outpatient clinics and ages 37 to 53. They were assigned into two equal groups at random (30 patients in each group). Group (A) received the Benson relaxation technique and active cycle breathing in addition to the standard medical protocol for COVID-19 for 14 days, while Group (B) received an active cycle of breathing daily in addition to the standard medical protocol for COVID-19 disease. The measurements, conducted via zoom meeting, were cortisol kits, fatigue assessment scale (FAS), hospital anxiety and depression scale (HADS), Modified Borg scale (MBS) and Multidimensional dyspnoea 12 scale (MDD-12).

Results: This study clearlyrevealeda significant difference in a.m. cortisol level between both groups post treatment. There was not any significant difference between both groups (A, B) post treatment in the following: FAS, HADS, MBS and MDD-12.

Conclusion: It has become clear that Benson's relaxation technique (BRT) is a high effective procedure in decreasing stress, anxiety and depression during quarantine of COVID.

Key Words: *Benson's relaxation – Telerehabilitation – Quality of life – Quarantine – COVID-19.*

Introduction

CORONAVIRUSES are a large group of viruses that infect both animals and humans. Some, such as the common cold, cause less severe disease, while others, such as Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome, cause more severe disease (SARS). They are from a different virus family than the ones that cause seasonal influenza **[1]**.

It is estimated that 80% of patients with corona virus disease (COVID-19) have obviousmild symptoms (without hospital admission). The remaining 20% will requireadvancedmedical attention, with 5% requiring intensive care unit admission. The average time from onset of symptoms to recovery for a mild disease is 2 weeks; for a severe or critical disease, the time range is 3-6 weeks **[2]**.

Domiciliary stress reduction and exercise-based interventions have been shown to be effective in patients with respiratory disorders and other health issues. As a result, it is hypothesized that implementing a telerehabilitation program reduces aggravation and hospitalizations among home-bound patients **[3]**.

One of the stress-relieving techniques is the Benson relaxation technique. This technique should be performed in a relaxed environment, calm relaxed state, mental concentration, and a positive attitude to have an effect on stress, anxiety, depression, and quality of life **[4]**.

The aim of this telerehabilitation study was to assist effect of Benson's relaxation technique on quality of life during quarantine of covid-19.

Patients and Methods

Subjects:

Sixty COVID-19 patients, familiar with using smartphones, were selected from Zagazig University Hospital's Chest Disease outpatient clinics. Their age ranged from 37 to 53 years. They were divided into two equal groups at random (30 pa-

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tients in each group). Group (A) received the Benson relaxation technique and active cycle breathing in addition to the standard medical protocol for COVID-19 for 14 days, while Group (B) received an active cycle of breathing daily in addition to the standard medical protocol for COVID-19. Inclusion criteria were: Sixty acute phase COVID-19 patients selectedfrom both genders; Patients who underwent polymerase chain reaction (PCR) testing and were found to have COVID-19 instances and were being held at home [3]; All patients have to be experiencing acute illness symptoms; Patients who did not require oxygen support and had an oxygen saturation of at least 92% [5]; The patients were isolated in their homes for 14 days by physician; BMI was less than 30kg/m^2. In this study, infected participants were randomly assigned to one of two equal groups, each of which included 30 patients with experience using smartphones. Exclusion criteria were; Patients affected with chronic neurological disorders, mental and/or psychological disorders (diseases), rheumatologic disorders (diseases), disc abnormalities, Illiterate patients andsystemic diseases (diabetes, hypertension, etc); patients who Previous COVID-19 attacks and/or previous trauma and deformity of chest; Pregnant females; Cancer patients.The study was conducted from April 2022 to September 2022. The protocol of BRT was done after ethical institutional approval.

Material:

ELISA assay kits were used to measure a.m. cortisol level [6]; hospital anxiety and depression scale (HADS) is a 14-item scale that produces seven items related to anxiety and seven items related to depression. A total score can be calculated (range 0-42) [7]; Fatigue assessment scale (FAS) is a 10-item scale evaluating symptoms of chronic fatigue. Total scores can range from 10 to 50, with 10 indicating the least amount of fatigue and 50 indicating the most [8]; Modified Borg scale (MBS) is used to help us understand the severity of your shortness of breath. A total score can be calculated (range 0-10) [9]; and Multidimensional Dyspnoea 12 (MDD-12) comprises 12 descriptors of breathlessness which is scored by theparticipant as “None”, “Mild”, “Moderate”, or “Severe”. A total score can be calculated (range 0-36) [10].

Procedures:

Group (A):

In a preparatory session the therapist explains Benson's Relaxation Technique and Active Cycle of Breathing Technique to every patient by zoom application.

Each patient had two sessions per day for 14 days after the intervention. The first session began at 8 a.m., followed by another at 8 p.m., and each session lasted 20 minutes under the researcher's online supervision followed by BRT session lasted 20 minutes, one in the morning and one in the evening.

Procedure of videoconference Active Cycle of Breathing [11]*:*

1- The patient was reclined in a comfortable position.
2- Relax diaphragmatic breathing (breathing control).
3- Do (3-4) Active deep inspirations,then a passive relaxed exhalation (Thoracic expansion exercises).
4- Relax diaphragmatic breathing (breathing control).
5- As the patient felt secretions entering the larger central airway, perform 2-3 huffs (forced exhalation technique) at low volume, followed by 2-3 huffs at higher volume, followed by relaxed breathing control.
6- If necessary, repeat the cycle 2-4 times more.

Benson relaxation technique (BRT) procedures:

The patient was asked to be in a supine comfortable position, (2) closedhis eyes, (3) relaxed all his muscles beginning from the soles of his feet, moving forward up, and relaxed all parts of his body, (4) breathed through his nose, payed attention to the sound of his breathing, and quietly said the word "one" to himself when the breath was out. For example, in... out, "one"; in... out, "one..., and (5) continue.

Group (B):

Each patient had two sessions per day for 14 days (at 8 a.m. and 8 p.m.).

Statistical analysis: The Shapiro-Wilk test was used to determine data normality; the Mann-Whitney test was used to compare (FAS, MBS, MDD-12, and HADS) between the two groups. An independent test was performed to compare the age and cortisol levels of the two groups; The paired *t*-test was used for within-group comparisons of mean cortisol levels before and after treatment, and the Wilcoxon test was used for the rest of the variables; The arithmetic mean is an average description of the results' central tendency; the standard deviation is a measure of the results' dispersion; The alpha level was set at 0.05, and all statistical analyses were carried out using the statistical

package for social studies (SPSS) version 27 for Windows.

Results

COVID patient's Age, sex and BMI as a pre-treatment demographic data showed no documented significant differenceneither between both groups nor within the same group (Table 1). Also, no significant differences between the 2 groups (A,B) pre-treatment in FAS, HADS, cortisol level, MBS and MDD-12 pre-treatment. There is significant difference in a.m. cortisol level and multidimensional Dyspnoea scale between both groups post treatment and non-significant difference between participant post treatment in HADS, MBS and FAS (Table 2).

Table (2): Outcomes analysis before and after ACBT alone or combined with BRT.

Outcomes measures	Group A (ACBT+BRT)	Group B (ACBT)	*p*-value
Cortisol level a.m.:	Mean ± SD	Mean ± SD	Mean ± SD
Pre	21.83±2.45	21.64±2.26	0.613
Post	16.18±4.69	19.13±3.66	0.015
p-value	<0.001	0.002	
HADS:	Mean ± SD	Mean ± SD	Mean ± SD
Pre	40.86± 1.15	40.55± 1.1	0.681
Post	6.43± 1.41	6.53± 1.26	0.732
p-value	<0.001	<0.001	
FAS:	Mean ± SD	Mean ± SD	Mean ± SD
Pre	40.3±0.84	40.28±0.78	0.961
Post	21.77±0.94	21.8±0.71	0.601
p-value	<0.001	<0.001	
MBS:	Mean ± SD	Mean ± SD	Mean ± SD
Pre	3.17±0.87	3.13±0.9	0.898
Post	0.6±0.42	0.6±0.42	1
p-value	<0.001	<0.001	
MDD12:	Mean ± SD	Mean ± SD	Mean ± SD
Pre	10.6±3.02	10.93±3.51	0.884
Post	2.1± 1.84	2.57± 1.94	0.348
p-value	<0.001	<0.001	

ACBT : Active cycle of breathing technique.
BRT : Benson's breathing technique.
HADS : Hospital anxiety and depression scale.
FAS : Fatigue assessment scale.
MBS : Modified Borg scale.
MDD 12. : Multidimensional dyspnoea 12.
SD : Standard deviation.
p-value : Probability value.
All significances were at $p<0.05$.

Table (1): Demographic data of both groups.

	Group A (ACBT+BRT)	Group B (ACBT)	*p*-value
Age (year) (Mean± SD)	42.97±3.49	44.23±4.25	0.239
BMI (kg/m^2) (Mean± SD)	24.27±2	24.27± 1.69	1.000
Sex %:			
Male	53.33	43.33	0.438
Female	46.61	56.67	

ACBT : Active cycle of breathing technique.
BRT : Benson's breathing technique.
BMI : Body mass index.
SD : Standard deviation.
p-value : Probability value.

Discussion

Coronavirus disease 2019 (COVID19) is a communicable disease caused by the novel of SARSCoV2 (severe acute respiratory syndrome coronavirus). The disease typically manifests as fever, cough, fatigue, breathing difficulties, and loss of taste and smell after a reported incubation period of 1-14 days.

The simplest effective intervention method Benson's relaxation technique includes mindfulness techniques that have an effect on a wide range of physical and psychological signs and symptoms such as anxiety, pain, depression, mood, and self-esteem, as well as reduced stress and improved sleep quality due to the effect of complete muscle relaxation.

Our study results are supported by the results of the previous studies: Elida et al., **[12]** Sustained deep inspiration in patients undergoing abdominal surgery caused significant decrease in serum cortisol.

Ismail et al., **[6]** Found that cortisol level, anxiety and depression got improved in female withperi-menopause-related functional dyspepsia after using BRT for 8 weeks.

Xiao et al., **[13]** reported that Breathing exercises improve emotions by lowering anxiety, depression, stress, and cortisol levels.

Wei et al., **[14]** observed that the physiological mechanisms of the effects of breathing interventions have revealed a common physiological improvement in breathing emotion, cognition, and cortisol level.

Motaz Alawna et al., **[15]** reported that Progressive muscle relaxation reduces disease severity

and associated stress, anxiety, and depression, and improves quality of life in COVID-19 patients.

Xiao et al., **[16]** found that Progressive muscle relaxation (PMR) significantly reduced anxiety and improved HADS in COVID-19 patients.

Li et al., **[17]** investigatedthe effect of Cognitive-behavioural Stress Management (CBSM) on anxiety, depression, and stress in COVID-19 patients. CBSM significantly reduced anxiety, depression, and stress in COVID-19 patients, according to Li et al. During the study or the follow-up period, no participant reported any harms.

Ali Mohamed **[18]** found that Home-based physical activity (HBPA) is an effective tool for improving cortisol, HADS, the St. George's Respiratory Questionnaire (SGRQ), and the 6-minute walk test (6MWT) in COPD patients, particularly during the COVID pandemic.

On the other hand: Lolak et al., **[19]** suggested that Adding structured PMR training to an established pulmonary rehabilitation (PR) program may not provide any additional benefit in terms of further reducing anxiety and depression in PR patients.

Conclusion:

Based on the scope and findings of this study, it could be concluded that telerehabilitation programme of BRT combined with ACBT significantly improved Am cortisol level, fatigue, dyspnoea, anxiety and depression in COVID-19 patients during quarantine period.

References

1- CHEN Y., GUO Y. and PAN Y.: "Structure analysis of the receptor binding of 2019-nCoV ". Biochem. Biophys Res. Commun., 525: 135-140, 2020.

2- World Health Organization: “Director-General's opening remarks at the media briefing on COVID-19”, 88 (21) https://www.who. int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19%2D%2D-11-march-2020.

3- GONZALEZ J., BERNAL C. and ANARTE E.: "Therapeutic pulmonary telerehabilitation protocol for patients affected by COVID-19, confined to their homes": Study protocol for a randomized controlled trial. Trials, 21: 588, 2020.

4- FATEME B., FATEMEH M., VAHID M., AREZOU N., MANIZHE N. and ZAHRA M.: "The effect of Benson's muscle relaxation technique on severity of pregnancy nausea." Electronic Journal of General Medicine, 16 (2): 19, 2019.

5- BARROT L., ASFAR P., MAUNY F., et al.: Liberal or conservative oxygen therapy for acute respiratory distress syndrome. N. Engl. J. Med., 382 (11): 999-1008. Available at: https://www.ncbi.nlm.nih.gov/pubmed/32160661, 2020.

6- ISMAIL A.A., SAAD A.E., ABD-ELRAHMAN N.F. and ELFAHL A. A.: "Effect of Benson's relaxation therapy alone or combined with aerobic exercise on cortisol, sleeping quality, estrogen, and severity of dyspeptic symptoms in perimenopausal women with functional dyspepsia". Eur. Rev. Med. Pharmacol. Sci., 26 (22): 8342-8350, 2022.

7- ANNA F.: “The Hospital Anxiety and Depression Scale” Occupational Medicine, 64 (5): 393-4, 2014.

8- AZMEH S., KATE N., SHAI M. and COLIN M.: "Fatigue Assessment Scale (FAS)" Springer, New York, NY: 161-2, 2011.

9- NERYS W.: "The Borg rating of perceived exertion (RPE) scale". Occup Med. (London), 67: 404-5, 2017.

10- AMADO D., PUENTE M. and ABASCAL B.: "Translation and validation of the multidimensional dyspnea-12 questionnaire." Arch. Bronconeumol., 54: 74-8, 2018.

11- LEE A., BURGE A. and HOLLAND A.: "Positive expiratory pressure therapy versus other airway clearance techniques for bronchiectasis". Cochrane Database of Systematic Reviews, (9). https://doi.org/10.1002/14651858.cd011699.pub2, 2017.

12- ELIDA MARA CARNEIRO, MARISA DE CARVALHO RAMOS, GUILHERME AZEVEDO TERRA, VIRMONDES RODRIGUES JÚNIOR, DÉLCIO MATOS and EDUARDO CREMA: “Evaluation of breathing exercise in hormonal and immunological responses in patients undergoing abdominal surgery”. Journal of Cirúrgica Brasileira, 28 (5): 385-90, 2013.

13- XIAO MA, ZI-QI YUE, ZHU-QING GONG, HONG ZHANG, NAI-YUE DUAN, YU-TONG SHI, GAO-XIA WEI and YOU-FA LI2: "The Effect of Diaphragmatic Breathing on Attention, Negative Affect and Stress in Healthy Adults". National Library of Medicine, Jun. 6.doi: 10.3389/fpsyg.2017.00874, 2017.

14- WEI G.X., LI Y., YUE X., MA X., CHANG Y., YI L., et al.: Tai Chi Chuan"modulates heart rate variability during abdominal breathing in elderly adults". Psych. J., 5 69-77. 10.1002/pchj.105, 2016.

15- MOTAZ ALAWNA and AYMAN A. MOHAMED: "An integrated intervention combining cognitive-behavioral stress management and progressive muscle relaxation improves immune biomarkers and reduces COVID-19 severity and progression in patients with COVID-19": A randomized control trial. Journalof Stress and Health, https: //doi.org/10.1002/smi.3151, 2022.

16- XIAO C.X., LIN Y.J., LIN R.Q., LIU A.N., ZHONG G.Q. and LAN C.F.: "Effects of progressive musclerelaxation-trainingon negative emotions and HADS in COVID-19patients": A clinical observational study. Medicine, 99 (47): e23185. https://doi.org/10.1097/MD.0000000000023185, 2020.

17- LI J., LI X., JIANG J., XU X., WU J., XU Y., LIN X., HALL J., XU H., XU J. and XU X.: "The effect of cognitive behavioral therapy on depression, anxiety, and stressin patients with COVID-19": A randomized controlled trial. Frontiers in Psychiatry, 11 (October), 1-12. https://doi.org/10.3389/fpsyt.2020.580827, 2020.

18-ALI ISMAIL A.: "Stress Axis Response to Aerobic Exercise in Chronic Obstructive Pulmonary Disease Patients". Advances in Rehabilitation, 36 (4): 24-32. https: //doi.org/10.5114/areh.2022.123180, 2022.

19- Lolak S.A., CONNORS G.L., SHERIDAN M.J.A. and WISE T.N.: "Effects of Progressive Muscle Relaxation Training on Anxiety and Depression in Patients Enrolled in an Outpatient Pulmonary Rehabilitation Program." Journal of Psychotherapy and Psychosomatics, 77: 119-125. https://doi.org/10.1159/000112889, 2008.

تأثير تقنية استرخاء بنسون ببرنامج التأهيل عن بعد على جودة الحياة أثناء عزل كوفيد١٩

الخلفية : تم الإبلاغ عن التوتر والقلق بشكل كبير أثناء عزل كوفيد١٩.

هدف الدراسة : التحقيق فى تأثير تقنية استرخاء بنسون ببرنامج التأهيل عن بعد على جودة الحياة أثناء عزل كوفيد١٩.

المرضى والطرق : تضمنت هذه الدراسة ستين مريضاً فى المرحلة الحادة من كوفيد١٩ من كلا الجنسين، تم اختيارهم من مرضى كوفيد١٩ المترددين على العيادات الخارجية لمستشفى الزقازيق الجامعى، تتراوح أعمارهم بين ٣٧ و ٥٣ عاماً. تم تقسيمهم إلى مجموعتين متساويتين بشكل عشوائى (٣٠ مريضاً فى كل مجموعة). تلقت المجموعة (أ) تقنية استرخاء بنسون ودورة التنفس النشطة بالإضافة إلى البروتوكول الطبى القياسى لكوفيد١٩ لمدة ١٤ يوماً، بينما تلقت المجموعة (ب) دورة نشطة من التنفس يومياً بالإضافة إلى البروتوكول الطبى القياسى لكوفيد١٩. كانت القياسات أجريت من خلال zoom meeting عبارة عن مجموعات الكورتيزول، ومقياس تقييم التعب (FAS)، مقياس الإكتئاب والتوتر والقلق بالمستشفى (HADS)، ومقياس بورغ المعدل (MBS) ومقياس ضيق التنفس متعدد الأبعاد ١٢ (MDD-12).

وقد أظهرت النتائج ما يلى : أن هناك اختلاف بارز فى مستوى الكورتيزول صباحاً بين المجموعتين بعد العلاج. كما لم يكن هناك فرق بارز بين المجموعتين بعد العلاج فى ما يلى : مقياس تقييم التعب، مقياس الإكتئاب والتوتر والقلق، مقياس بورغ المعدل ومقياس ضيق التنفس متعدد الأبعاد.

الخلاصة : تقنية استرخاء بنسون هو إجراء فعال للغاية فى تقليل التوتر والقلق والاكتئاب.